CITY OF SUNNYVALE
REPORT
Administrative Hearing

June 16, 2004

SUBJECT: **2004-0346** – **Metro PCS** [Applicant] **Central California Conference Association of the Seventh Day Adventist Church** [Owner]: Application for a Use Permit on a 2.4-acre site to allow three roof-mounted antennas within a new steeple and associated ground equipment. The property is located at **653 West Fremont Avenue** in an R-1(Low-Density Residential) Zoning District. (APN: 202-06-003)

Motion: Use Permit to allow installation of three roof mounted antennas within an enclosed structure and ancillary equipment within a building.

REPORT IN BRIEF

Existing Site Conditions: Church

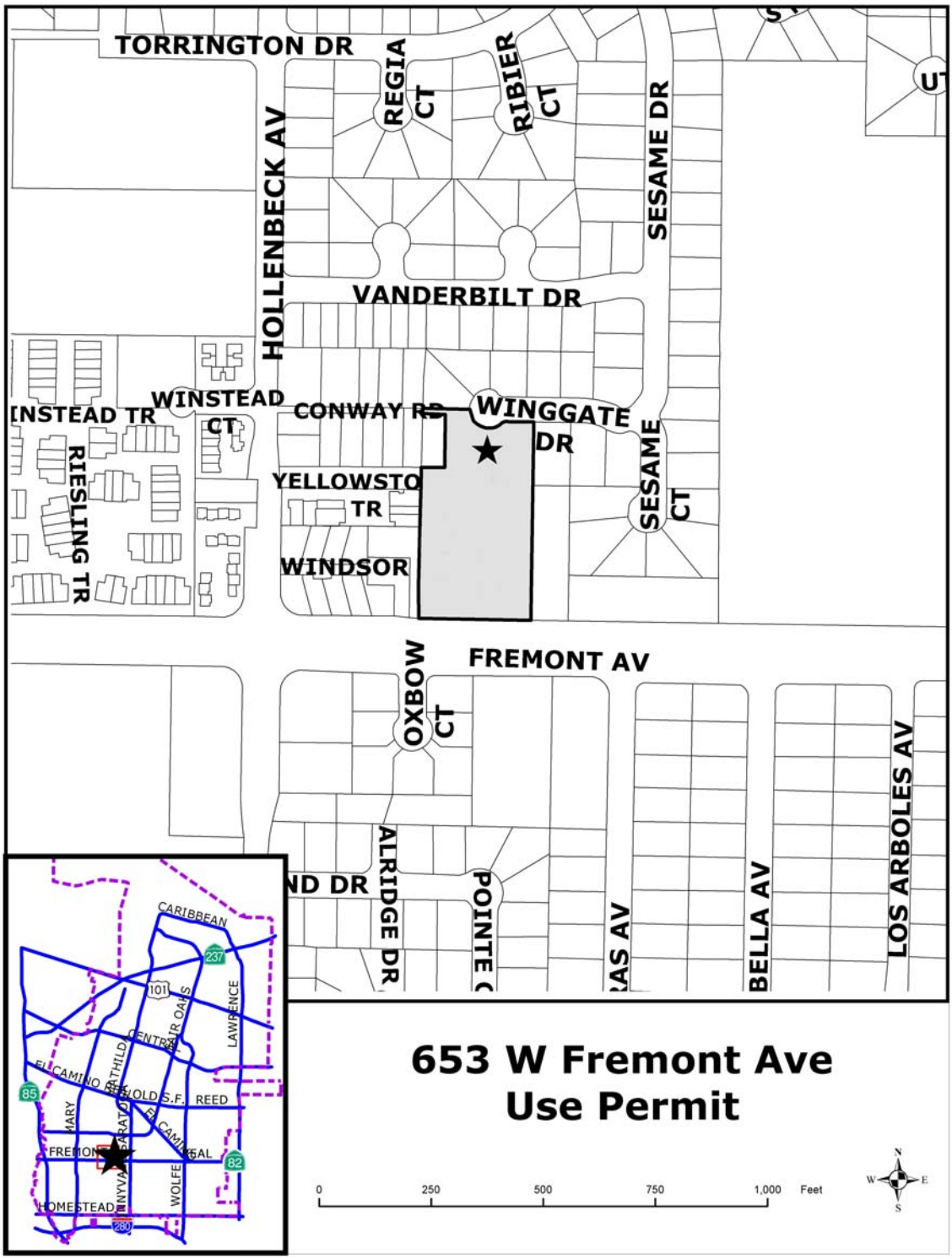
Surrounding Land Uses

North	Residential
South	Residential
East	Residential
West	Residential

Issues: Aesthetics

Environmental Status: A Class 1 Categorical Exemption relieves this project from California Environmental Quality Act provisions and City Guidelines.

Staff Recommendation: Approve with Conditions


TORRINGTON DR
REGIA CT
RIBIER CT
SESAME DR
HOLLENBECK AV
VANDERBILT DR
WINSTEAD CT
CONWAY RD
WINGGATE DR
YELLOWSTO TR
WINDSOR
RIESLING TR
SESAME CT
FREMONT AV
OXBOW CT
ALRIDGE DR
POINTE
BELLA AV
LOS ARBOLES AV
CARIBBEAN
LAWRENCE
EL CAMINO
S.F.
REED
FREMONT
HOMESTEAD
WOLFE
653 W Fremont Ave
Use Permit
0
250
500
750
1,000
Feet
N
S
E
W

PROJECT DATA TABLE

	EXISTING	PROPOSED	REQUIRED
General Plan Category	Residential Low Density	Same	---
Zoning District	R-0 and R-1	Same	---
Type of Project	Church	Wireless Telecommunications Facility	Use Permit
Lot Size (sq. ft.)	2.4 acres	Same	8,000
Gross Floor Area (sq. ft.)	23,968 sq. ft. Approved	Same	---
Lot Coverage (%)	23.02%	23.22%	40%
No. of Buildings On-Site	4 Approved	Same	---
Building Height (ft.)	37'4" feet	53'5" feet	30 ft. max; 25 feet above for architectural features
Setbacks of Steeple			
• **Front**	---	136 ft.	20 ft. min.
• **Left Side (facing prop.)**	---	65 ft.	90 ft. min. (See Discussion)
• **Right Side (facing prop.)**	---	85 ft.	90 ft. min. (See Discussion)
• **Rear**	---	140 ft.	20 ft. min

ANALYSIS

Background

Recent Previous Actions on the Site: The following table summarizes previous planning applications related to the subject site. Please note the 2000-0287 was never constructed and the permit is expired.

File Number	Brief Description	Hearing/Decision	Date
2002-0346	Installation of two temporary classrooms	Administrative Hearing/Approved	6/12/02
2000-0287	Wireless communication antennas on a 55' monopole	PC Hearing/ Approved	7/24/00

File Number	Brief Description	Hearing/Decision	Date
2000-0087	Master phasing plan and classroom additions	Administrative Hearing/Approved	6/14/00
1992-0161	Rezone From R1 to R0 for north portion of the site	CC Hearing/ Approved	6/23/92
1992-0159	4-lot Subdivision	CC Hearing/ Approved	7/23/92

Description of Proposed Project

The proposed project is for the installation of 3 panel antennas installed within a new 17 foot high steeple constructed on top of an existing church. The project also involves the installation of ancillary equipment within the existing building. The design of the steeple and internal placement of the antennas will completely eliminate any visibility of the antennas from the surrounding area.

Environmental Review

A Class 1 Categorical Exemption relieves this project from California Environmental Quality Act provisions and City guidelines. Class 1 Categorical Exemptions include minor additions to existing facilities.

Use Permit

Use: The project site currently consists of buildings and classroom facilities for religious activities. The proposed use is for a wireless telecommunication facility at an existing church site. The project involves the installation of three panel antennas within a new steeple architectural feature positioned on top of a church building. Ancillary equipment would be located within the existing building. No other wireless facilities are located on the site. Roof mounted antennas less than 15' feet in height may be considered with a minor use permit for non-residential use in a residential zone.

Site Layout: The current site layout has both the classrooms, chapel and sanctuary located at the right side of the site, with parking available to the left and rear of the site. Recently approved plans for the site (6/14/2000) will allow additions to the existing buildings, one new fellowship hall, parking lot improvements, and new landscaping.

Architecture: A traditional steeple feature approximately 17 feet in height is proposed to be added to the existing eastern building situated parallel to Fremont. The steeple is proposed to be painted white with a smooth finish.

Landscaping: The proposal does not include any additional landscaping for the site or modification to existing landscaping.

Parking/Circulation: No additional parking is required for the proposed use. Access to the antennas and equipment is provided with the existing parking lot.

Compliance with Development Standards

The following sections of the Wireless Telecommunication Ordinances of the Sunnyvale Municipal Code apply the proposed project:

19.54.40 (b) - All facilities shall be designed to minimize the visual impact to the greatest extent feasible, considering technological requirements, by means of placement, screening, and camouflage, to be compatible with existing architectural elements and building materials, and other site characteristics. The applicant shall use the smallest and least visible antennas possible to accomplish the owner/operator's coverage objectives.

19.54.040 (c) - Colors and materials for facilities shall be chosen to minimize visibility. Facilities shall be painted or textured using colors to match or blend with the primary background.

The antennas will be camouflaged within the the new steeple and will not be visible to the surrounding properties. The steeple itself is a traditional church features and is proportionate and appropriate to the site due to its interior location and extensive setbacks. The ancillary equipment is not visible from the public street or neighboring properties due to its location within the building.

19.54.030 (c) – Certification must be provided that the proposed facility will at all times comply with applicable health requirements and standards pertaining to RF emissions.

This project meets all FCC RF emissions standards as noted in the radio frequency analysis provided by the applicant.

Expected Impact on the Surroundings

As required by FCC regulations, the proposal shall comply with all RF emission standards. The applicant has submitted a study, conducted by Diamond Services, that indicates that the facility does not exceed the maximum exposure levels permitted by the FCC. Staff has also determined that the steeple will not have negative aesthetic impact to the surrounding area. The ancillary equipment is appropriately located in the church building.

Findings, General Plan Goals and Conditions of Approval

Staff was able to make the required Findings based on the justifications for the Use Permit.

- Findings and General Plan Goals are located in Attachment 1.
- Conditions of Approval are located in Attachment 2.

Fiscal Impact

No fiscal impacts other than normal fees and taxes are expected.

Public Contact

Notice of Public Hearing	Staff Report	Agenda
• Published in the *Sun* newspaper • Posted on the site • Mailed to 35 adjacent property owners and residents of the project site	• Posted on the City of Sunnyvale's Website • Provided at the Reference Section of the City of Sunnyvale's Public Library	• Posted on the City's official notice bulletin board • City of Sunnyvale's Website • Recorded for SunDial

No inquires concerning the application have been received.

Alternatives

1. Approve the Use Permit with the attached conditions.

2. Approve with Use Permit with modified conditions.

3. Deny the Use Permit.

Recommendation

Recommend Alternative 1.

Prepared by:

Kelly Diekmann
Project Planner

Reviewed by:

Diana O'Dell
Senior Planner

Attachments:

1. Recommended Findings
2. Recommended Conditions of Approval
3. Site and Architectural Plans
4. Letter from the Applicant
5. RF Emissions Analysis
6. Photosimulations

Recommended Findings - Use Permit

1. The proposed use attains the objectives and purposes of the General Plan of the City of Sunnyvale. The Wireless Telecommunications Policy promotes retention of local zoning authority when reviewing telecommunication facilities. The zoning code requires that the location of telecommunication facilities be designed with sensitivity to the surrounding areas. The proposed facility is compliant with all wireless telecommunication development standards:

    - The project meets all FCC RF emissions standards:
    - As proposed, the antennas are not visible from residentially zoned properties.
    - The project is not visible from any major arterial streets, freeways or expressways.
    - The project is not visible from the Downtown Specific Plan area or other areas identified in the Telecommunications code as being sensitive.

2. The proposed use is desirable, and will not be materially detrimental to the public welfare or injurious to the property, improvements or uses within the immediate vicinity and within the Zoning District. As conditioned, the proposed co-location meets the visual standards established by the City of Sunnyvale for telecommunication facilities. The project also meets all FCC RF emissions standards.

Recommended Conditions of Approval - Use Permit

In addition to complying with all applicable City, County, State and Federal Statutes, Codes, Ordinances, Resolutions and Regulations, Permittee expressly accepts and agrees to comply with the following conditions of approval of this Permit:

Unless otherwise noted, all conditions shall be subject to the review of approval of the Director of Community Development.

1. Submit for Building Permits prior to construction/installation activity.

2. The conditions of approval shall be reproduced on cover sheet of the plans submitted for a Building Permit for this project.

3. Any noise associated with the proposed facility shall not exceed requirements set forth in Section 19.42.030 of Sunnyvale Municipal Code.

4. Every owner or operator of a wireless telecommunication facility shall renew the facility permit at least five (5) years from the date of initial approval.

5. The maximum height of the steeple addition above the existing roofline is 17 feet, and the antenna at 15 feet. Any major modifications or expansion of the approved use shall be approved at a separate public hearing by the Director of Community Development. Minor modifications shall be approved by the Director of Community Development.

6. Each facility must comply with any and all applicable regulations and standards promulgated or imposed by any state or federal agency, including but not limited to, the Federal Communication Commission and Federal Aviation Administration.

7. Certification must be provided that the proposed facility will at all times comply with all applicable health requirements and standards pertaining to RF emissions.

8. The owner or operator of any facility shall obtain and maintain at all times a current business license issued by the city.

9. The owner or operator of any facility shall submit and maintain current at all times basic contact and site information on a form to be supplied by the city. Applicant shall notify city of any changes to the information

submitted within thirty (30) days of any change, including change of the name or legal status of the owner or operator. This information shall include, but is not limited to the following:

a. Identity, including name, address and telephone number, and legal status of the owner of the facility including official identification numbers an FCC certification, and if different from the owner, the identity and legal status of the person or entity responsible for operating the facility.

b. Name, address and telephone number of a local contact person for emergencies.

b. Type of service provided.

10. All facilities and related equipment, including lighting, fences, shields, cabinets, and poles, shall be maintained in good repair, free from trash, debris, litter and graffiti and other forms of vandalism, and any damage from any cause shall be repaired as soon as reasonably possible so as to minimize occurrences of dangerous conditions or visual blight. Graffiti shall be removed from any facility or equipment as soon as practicable, and in no instance more than forty-eight (48) hours from the time of notification by the city.

11. Each facility shall be operated in such a manner so as to minimize any possible disruption caused by noise. Backup generators shall only be operated during periods of power outages, and shall not be tested on weekends or holidays, or between the hours of 10:00 p.m. and 7:00 a.m. on weekend nights. At no time shall equipment noise from any source exceed an exterior noise level of 60 dB at the property line.

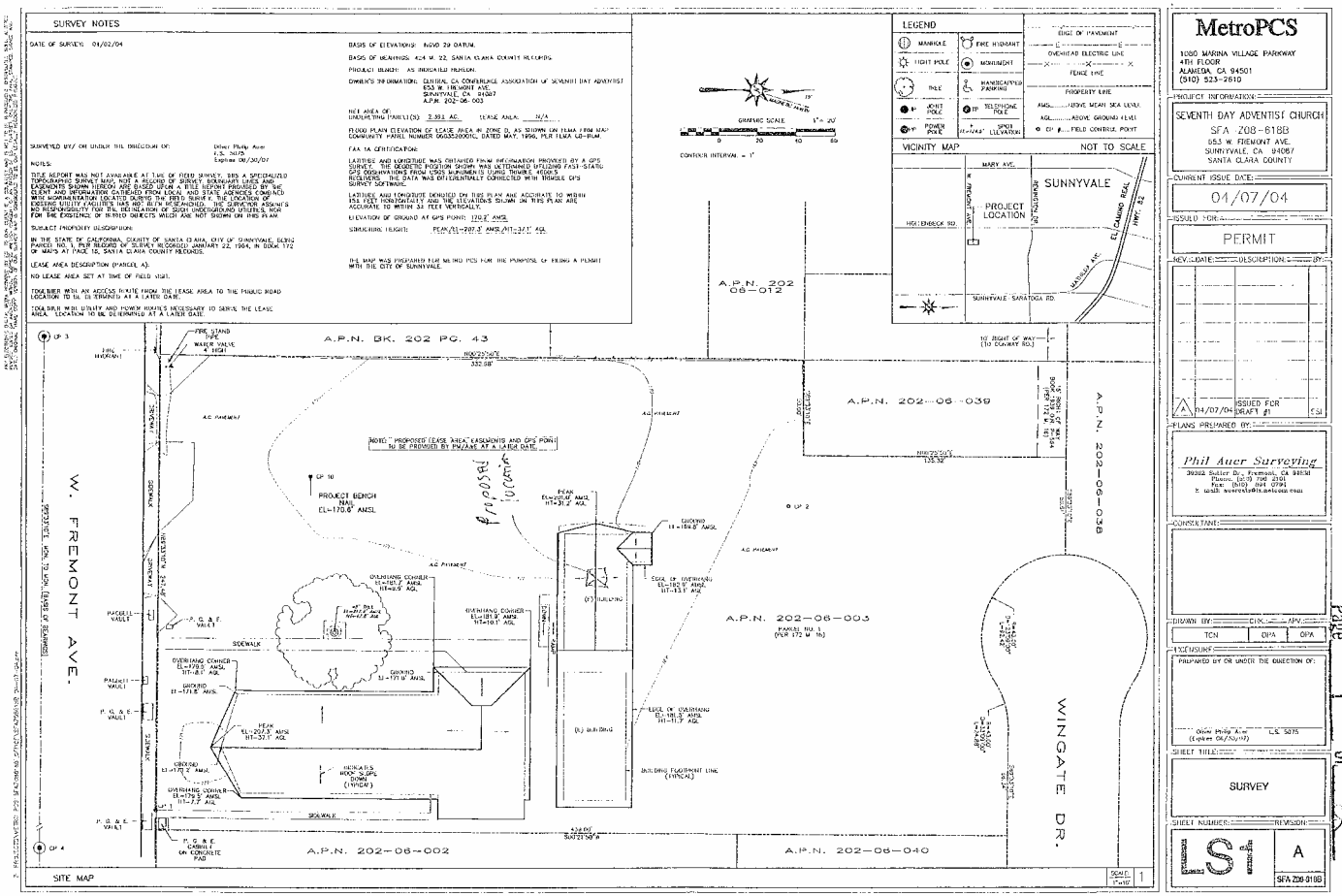
12. Each owner or operator of a facility shall routinely and regularly inspect each site to ensure compliance with the standards set forth in the Telecommunications Ordinance.

13. The wireless telecommunication facility provider shall defend, indemnify, and hold harmless the city of any of its boards, commissions, agents, officers, and employees from any claim, action or proceeding against the city, its boards, commission, agents, officers, or employees to attack, set aside, void, or annul, the approval of the project when such claim or action is brought within the time period provided for in applicable state and/or local statutes. The city shall promptly notify the provider(s) of any such claim, action or proceeding. The city shall have the option of coordination in the defense. Nothing contained in this stipulation shall prohibit the city from participating in a defense of any claim, action, or

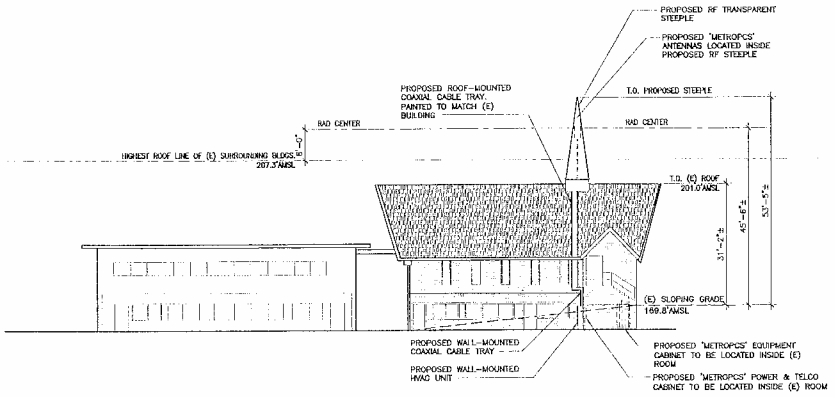
proceeding if the city bears its own attorney's fees and costs, and the city defends the action in good faith.

14. Facility lessors shall be strictly liable for any and all sudden and accidental pollution and gradual pollution resulting from their use within the city. This liability shall include cleanup, intentional injury or damage to persons or property. Additionally, lessors shall be responsible for any sanctions, fines, or other monetary costs imposed as a result of the release of pollutants from their operations. Pollutants mean any solid, liquid, fumes, acids, alkalis, chemicals, electromagnetic waves and waste. Waste includes materials to be recycled, reconditioned or reclaimed.

15. Wireless telecommunication facility operators shall be strictly liable for interference caused by their facilities with city communication systems. The operator shall be responsible for all labor and equipment costs for determining the source of the interference, all costs associated with eliminating the interference, (including but not limited to filtering, installing cavities, installing directional antennas, powering down systems, and engineering analysis), and all costs arising from third party claims against the city attributable to the interference.

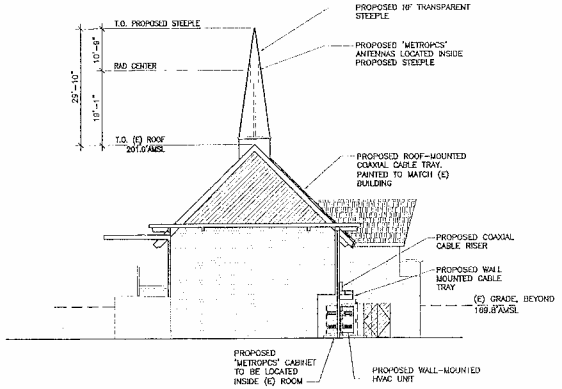


ATTACHMENT 3
Page 1 of 2



NORTH ELEVATION

SCALE: 1/8"=1'-0" | 1



EAST ELEVATION

SCALE: 1/8"=1'-0" | 2

ATTACHMENT 3
Page 2 of 2

MetroPCS
1000 METRO VILLAGE PARKWAY
FOURTH FLOOR
ALAMEDA, CA 94502
Phone: (925) 523-2610

DCI PACIFIC
ARCHITECTURE - ENGINEERING - PLANNING
2951-B ABRAM AVENUE
COSTA MESA, CA 92626
Tel: 714-424-1420 FAX: 714 424 1424

SEVENTH DAY ADVENTIST CHURCH PROJECT (SFA #18-A

ISSUED/REVISED FOR PLANNING/CD REVIEW

ISSUE	
DATE	DESCRIPTION
04/12/04	PRELIMINARY ZD
04/21/04	FINAL ZD

REVISIONS	
NO.	DATE
1	
2	
3	
4	
5	

DRAWN BY: HH
CHECKED BY: DCK
APPROVED BY: DKD

SITE NAME
SEVENTH DAY ADVENTIST CHURCH

SITE NUMBER
SFA-Z08-618-B

SITE ADDRESS
653 W. FREMONT AVE.
SUNNYVALE, CA 94087

SHEET TITLE
ELEVATIONS

SHEET NUMBER
A3

USE PERMIT JUSTIFICATIONS

The Municipal Code states that at least one of the following two justifications must be met before granting the Use Permit.

1. Attains the objectives and purposes of the General Plan of the City of Sunnyvale, or

Project Description:
MetroPCS is requesting a Use Permit and any other permits necessary to allow for the construction and operation of an unmanned telecommunications facility at the Seventh Day Adventist Church, 653 W. Fremont Avenue in the City of Sunnyvale. The subject property is in a designated R1 (Low Density Residential) Zoning District. The proposed facility consists of stealthing three (3) antennas inside a radio frequency transparent steeple and mounting it to the rooftop of the church. The stealthing design also offers a distinct character trait to the church. The three (3) associated equipment cabinets will be hidden from view inside an existing vacant room of the church. The total lease area measures approximately 230 square feet.

MetroPCS has been sensitive to attain their goal of designing a facility that is located for maximum function and minimum impact on adjacent uses. Stealthing the antennas inside a new church steeple and locating the equipment cabinets inside a vacant room meets the visual mitigation goals of Sunnyvale thereby protecting the existing neighborhood, yet, at the same time, promoting the economic well being and vitality of the City by providing enhanced wireless telecommunications technology. The proposed facility meets the objectives and goals of the general plan, city-wide design guidelines, and the chapter requirements and standards for wireless telecommunication facilities.

2. is desirable and not materially detrimental to the public welfare or injurious to the property, improvements or uses within the immediate vicinity and within the zoning district.

The proposed facility will be a desirable asset to the City of Sunnyvale and will not be materially detrimental to the public welfare or injurious to the property, improvements or uses within the immediate vicinity and within the zoning district. The proposed facility will be an essential part of metroPCS' network system and will have a positive prominence in the area. Statistically, as of April 2004 there are currently over 157 million total wireless phone subscribers in the United States. In number, cell phones are creeping up on landline phones, comprising about 43 percent of all U.S. phones. As many as 7.5 million Americans rely on their cell phone as their sole personal telephone.[1] With the increasing numbers of people expecting reliable wireless service for their personal and business needs, the operation of this facility will have a favorably influence and safeguard the peace, health, safety, morals and welfare of persons who live and work in the City of Sunnyvale.

[1] Cellular Telecommunications and Internet Association, April 2004.

CITY OF SUNNYVALE WIRELESS TELECOMMUNICATIONS FACILITY

PROJECT SUMMARY

Applicant

MetroPCS Inc. is a privately held telecommunications service provider formed in 1994. MetroPCS holds 14 personal communications services (PCS) licenses in the United States. MetroPCS has implemented an innovative and affordable pricing structure to capitalize on wireless customers' demand sensitivity to price. The company believes that a substantial market opportunity exists to essentially eliminate the pricing gap between existing heavy usage cellular airtime and wire line telephone rates. Relative to current wireless service packages, metroPCS offers more affordable wireless service packages that are available to more citizens of the Bay Area.

MetroPCS is certain that by offering predictable and affordable prices they can attract customers who do not currently use wireless services and customers who are already high-volume users. The company also feels that due to relatively high per minute airtime charges and unpredictable monthly bills, there is a price-sensitive mass consumer market that refrains from subscribing to or extensively using cellular services.

MetroPCS offers high quality network coverage by concentrating its network build-out in the "high-usage" areas of its markets. MetroPCS limits the construction of its networks outside of these high-usage areas as the company believes the incremental cost of building out such network coverage is substantial and is inconsistent with the company's objective to be the low cost provider of wireless communications services. MetroPCS is truly a local wireless service provider.

In line with this strategy, metroPCS looks to minimize the amount of new antenna support structures in its markets and is pursuing co-locating on existing structures as the first and best alternative. MetroPCS understands that the quickest way to market is to work with local planning agencies that allows it to be both financially successful and a responsible corporate citizen. The goal of metroPCS is to offer affordable mobile telephony to consumers in the areas where they are most likely to use them.

Personal Communication Services

Personal Communication Services or "PCS" represents a new generation of wireless technology. By utilizing digital transmission, PCS is able to dramatically improve the quality of service for wireless consumers. Conventional analog-cellular systems do not have the advantage of speaking in the digital language of computers. This digital transmission allows PCS to outperform traditional cellular in a number of ways, including:

- Improved voice quality and consistency
- Increased security and privacy
- Feature-rich digital service choices such as voice mail, paging, and caller ID
- Digital data transmission

PCS Site Selection

Please refer to the attached Master Plan Map for metroPCS' existing and proposed facilities in the City of Sunnyvale.

Once the decision has been made to expand PCS coverage to a community, metroPCS engineers prepare a preliminary network design based on many factors, including the characteristics of the community, available radio frequencies, and wireless equipment capabilities. A map of the selected "search area" and other requirements for the site are provided to property consultants who visit the community to identify and rank potential sites. This search area represents the area in which a facility must be located to allow it to function as an integral unit in the metroPCS system.

Whenever feasible, metroPCS strives to acquire sites that blend with local character and are unobtrusive to the community. Existing structures such as water tanks, building rooftops, and competitor-owned towers are often the first choice for sites. When construction of a new structure is required, sites are chosen by their proximity to compatible land uses. Wireless communication facilities must be considered as part of a network, not as individual locations. Communication facilities can be likened to links in a chain, one link adds to the next, making the network design larger. Once these links, or communication facilities, are constructed, it is difficult to adjust the network design or move individual sites.

Property Description

Please refer to "Legal Description & Property Maps" submitted within this application package.

The proposed facility will be located at the Seventh Day Adventist Church, 653 W. Fremont Avenue in the City of Sunnyvale. The Central California Conference Association of Seventh Day Adventist owns the subject parcel and the assessor's number is 202-06-003. The property is in a designated R1 (Low Density Residential) Zoning District. Situated on the property are three building that are being utilized by the church. Also, there is an ample parking lot and various landscaped areas that are plotted around the property.

Nature of Request/Zoning Analysis

Please refer to the "Site Development Plans and Elevations" and "Photosimulations" submitted within this application package.

MetroPCS is requesting a Conditional Use Permit and any other permits necessary to allow for the construction and operation of an unmanned telecommunications facility. The entire lease area will be approximately 230 square feet. The proposed project consists of stealthing three (3) antennas inside a radio frequency transparent steeple and mounting it to the rooftop of the church. Stealthing the antennas in a steeple meets the criteria for mitigation of visual impact for roof mounted antennas. The height to the top of the new steeple will be 53'-5" thus meeting the minimum height possible in serving metroPCS' service area needs. The three (3) associated equipment cabinets will be located inside an existing vacant room and thus fully hidden from view. MetroPCS will not remove any of the existing vegetation on the property. All setbacks will be complied with and no streets, rights-of-way, or easements encroached upon.

Pursuant to Chapter 19.54, "Wireless Telecommunication Facilities," Table 19.54.080, "Telecommunication Facilities Permits," a Major Use Permit is required in a R1 Zoning District.

Therefore, metroPCS is requesting a Conditional Use Permit that is necessary for the installation and operation of an unmanned wireless telecommunications facility at the above described subject property.

Communication Facility Components and Operations

Each metroPCS communication facility consists of a tower or other support structure, panel antennas, base station equipment and a generator or emergency power source, when needed. No nuisances will be generated by the proposed PCS facility, nor will the facility injure the public health, safety, morals or general welfare. PCS technology does not interfere with any other forms of communication whether public or private. To the contrary, PCS technology will provide vital communications in emergency situations and will commonly be used by local residents of Sunnyvale and emergency personnel to protect the general public's health, safety and welfare.

Statement of Operations

Once the construction of the PCS facility is complete and the telephone switching equipment is fine-tuned, visitation to the site by service personnel for routine maintenance will occur an average of once a month. The site is entirely self-monitored and connects directly to a central office where sophisticated computers alert personnel to any equipment malfunction or breach of security.

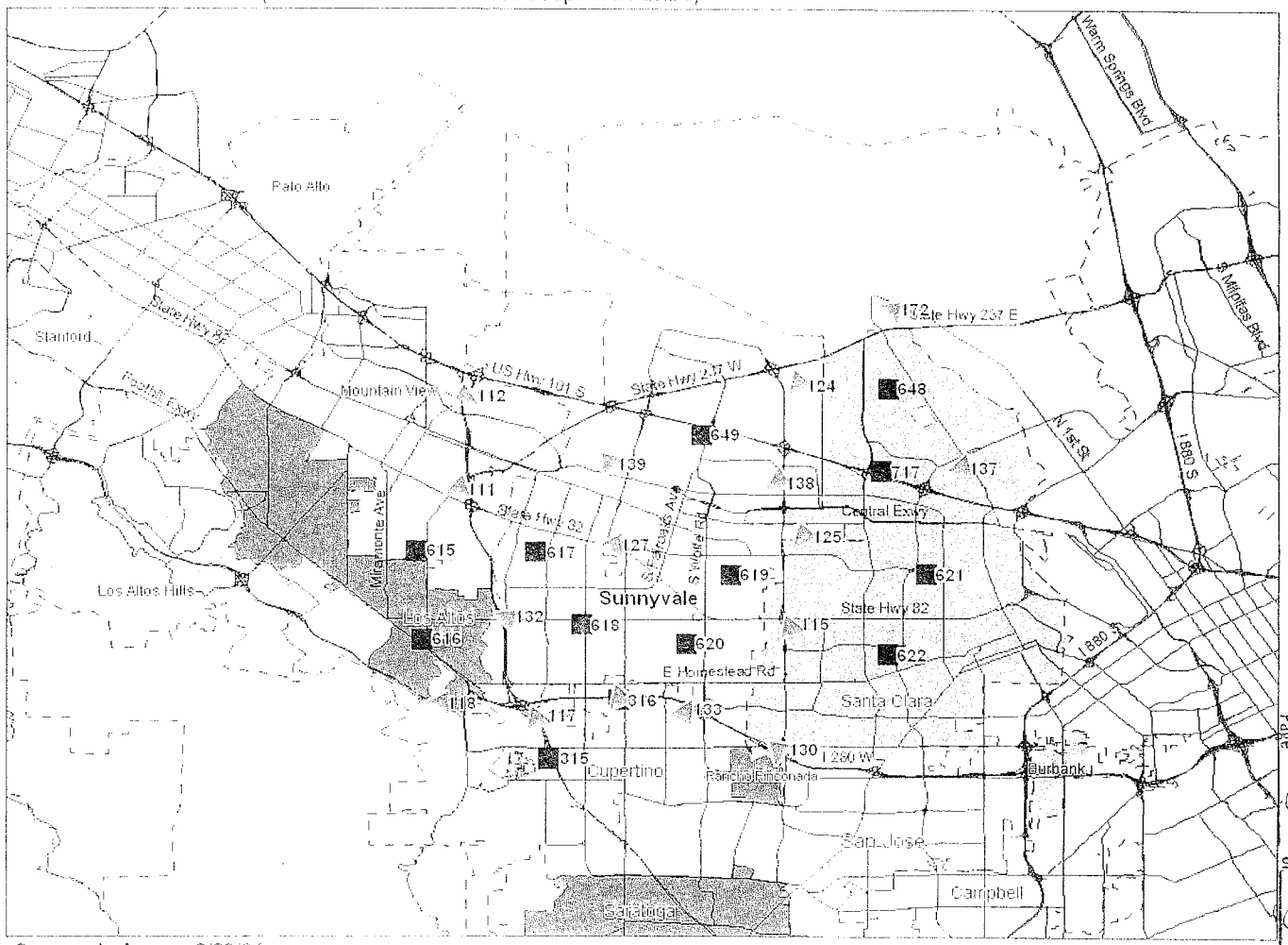
As the proposed facility will be unstaffed, there will be no impact to existing traffic patterns. No water or sewer services will be required. Ingress and egress will be provided along with parking for service personnel who arrive infrequently to service the site.

Compliance with Federal Regulations

Please refer to the attached Radio Station Authorization form issued by the FCC.

MetroPCS will comply with all FCC rules governing construction requirements, technical standards, interference protection, power and height limitations, and radio frequency standards. In addition, the company will comply with all FAA rules on site location and operation.

MetroPCS Site Locations (GREEN=On Air - BLACK=Proposed Future)



Sunnyvale Area 3/30/04

MetroPCS • Proposed Base Station (Site No. SFA-Z08-618B)
653 West Fremont Avenue • Sunnyvale, California

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of MetroPCS, a wireless telecommunications carrier, to evaluate the base station (Site No. SFA-Z08-618B) proposed to be located at 653 West Fremont Avenue in Sunnyvale, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

Prevailing Exposure Standards

The U.S. Congress requires that the Federal Communications Commission ("FCC") evaluate its actions for possible significant impact on the environment. In Docket 93-62, effective October 15, 1997, the FCC adopted the human exposure limits for field strength and power density recommended in Report No. 86, "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," published in 1986 by the Congressionally chartered National Council on Radiation Protection and Measurements ("NCRP"). Separate limits apply for occupational and public exposure conditions, with the latter limits generally five times more restrictive. The more recent Institute of Electrical and Electronics Engineers ("IEEE") Standard C95.1-1999, "Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," includes nearly identical exposure limits. A summary of the FCC's exposure limits is shown in Figure 1. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

The most restrictive thresholds for exposures of unlimited duration to radio frequency energy for several personal wireless services are as follows:

Personal Wireless Service	Approx. Frequency	Occupational Limit	Public Limit
Personal Communication ("PCS")	1,950 MHz	5.00 mW/cm^2	1.00 mW/cm^2
Cellular Telephone	870	2.90	0.58
Specialized Mobile Radio	855	2.85	0.57
[most restrictive frequency range]	30–300	1.00	0.20

General Facility Requirements

Base stations typically consist of two distinct parts: the electronic transceivers (also called "radios" or "cabinets") that are connected to the traditional wired telephone lines, and the passive antennas that send the wireless signals created by the radios out to be received by individual subscriber units. The transceivers are often located at ground level and are connected to the antennas by coaxial cables about 1 inch thick. Because of the short wavelength of the frequencies assigned by the FCC for wireless services, the antennas require line-of-sight paths for their signals to propagate well and so are installed at some height above ground. The antennas are designed to concentrate their energy toward the

horizon, with very little energy wasted toward the sky or the ground. Along with the low power of such facilities, this means that it is generally not possible for exposure conditions to approach the maximum permissible exposure limits without being physically very near the antennas.

Computer Modeling Method

The FCC provides direction for determining compliance in its Office of Engineering and Technology Bulletin No. 65, "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radio Frequency Radiation," dated August 1997. Figure 2 attached describes the calculation methodologies, reflecting the facts that a directional antenna's radiation pattern is not fully formed at locations very close by (the "near-field" effect) and that the power level from an energy source decreases with the square of the distance from it (the "inverse square law"). The conservative nature of this method for evaluating exposure conditions has been verified by numerous field tests.

Site and Facility Description

Based upon information provided by Metro, including zoning drawings by DCI Pacific, dated April 12, 2004, it is proposed to mount three EMS Model MTRR7517-000DPL directional panel antennas within a new spire to be built at the Seventh Day Adventist Church, located at 653 Fremont Avenue in Sunnyvale. The antennas would be mounted at an effective height of about 43 feet above ground, 5 feet above the roof peak, and would be oriented at 120° spacing, to provide service in all directions. The maximum effective radiated power in any direction would be 1,890 watts, representing six channels operating simultaneously at 315 watts each. There are reported no other wireless telecommunications base stations installed nearby.

Study Results

The maximum ambient RF level anywhere at ground due to the proposed Metro operation is calculated to be 0.0027 mW/cm^2, which is 0.27% of the applicable public exposure limit. The maximum calculated level on the roof of the subject building is expected to exceed the public exposure limit within 12 feet of the face of the antennas. The maximum level at the second floor elevation of any nearby home* is 0.51% of the public exposure limit. It should be noted that these results include several "worst-case" assumptions and therefore are expected to overstate actual power density levels.

Recommended Mitigation Measures

Since they are to be mounted within the church spire, the Metro antennas are not accessible to the general public, and so no mitigation measures are necessary to comply with the FCC public exposure

* Located at least 125 feet away, based on aerial photographs from Maps a la carte, Inc.

guidelines. To prevent occupational exposures in excess of the FCC guidelines, no access within 5 feet directly in front of the Metro antennas themselves, such as might occur during maintenance work on the spire or roof, should be allowed while the base station is in operation, unless other measures can be demonstrated to ensure that occupational protection requirements are met. Posting explanatory warning signs† at the antennas and/or on the spire below the antennas, such that the signs would be readily visible from any angle of approach to persons who might need to work within that distance, would be sufficient to meet FCC-adopted guidelines.

Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that the base station proposed by MetroPCS at 653 West Fremont Avenue in Sunnyvale, California, can comply with the prevailing standards for limiting human exposure to radio frequency energy and, therefore, need not for this reason cause a significant impact on the environment. The highest calculated level in publicly accessible areas is much less than the prevailing standards allow for exposures of unlimited duration. This finding is consistent with measurements of actual exposure conditions taken at other operating base stations.

Authorship

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2005. This work has been carried out by him or under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.

William F. Hammett, P.E.

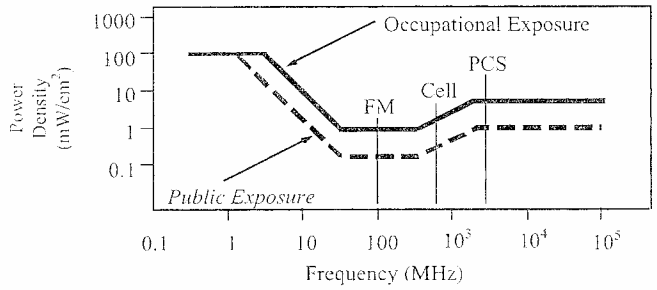
April 22, 2004

† Warning signs should comply with ANSI C95.2 color, symbol, and content conventions. In addition, contact information should be provided (e.g., a telephone number) to arrange for access to restricted areas. The selection of language(s) is not an engineering matter, and guidance from the landlord, local zoning or health authority, or appropriate professionals may be required.

The U.S. Congress required (1996 Telecom Act) the Federal Communications Commission ("FCC") to adopt a nationwide human exposure standard to ensure that its licensees do not, cumulatively, have a significant impact on the environment. The FCC adopted the limits from Report No. 86, "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," published in 1986 by the Congressionally chartered National Council on Radiation Protection and Measurements, which are nearly identical to the more recent Institute of Electrical and Electronics Engineers Standard C95.1-1999, "Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz." These limits apply for continuous exposures from all sources and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

As shown in the table and chart below, separate limits apply for occupational and public exposure conditions, with the latter limits (in *italics* and/or dashed) up to five times more restrictive:

Frequency	Electromagnetic Fields (f is frequency of emission in MHz)					
Applicable Range (MHz)	Electric Field Strength (V/m)		Magnetic Field Strength (A/m)		Equivalent Far-Field Power Density (mW/cm^2)	
0.3 - 1.34	614	*614*	1.63	*1.63*	100	*100*
1.34 - 3.0	614	*823.8/f*	1.63	*2.19/f*	100	*180/f^2*
3.0 - 30	1842/ f	*823.8/f*	4.89/ f	*2.19/f*	900/ f^2	*180/f^2*
30 - 300	61.4	*27.5*	0.163	*0.0729*	1.0	*0.2*
300 - 1,500	$3.54\sqrt{f}$	*$1.59\sqrt{f}$*	$\sqrt{f}/106$	*$\sqrt{f}/238$*	f/300	*f/1500*
1,500 - 100,000	137	*61.4*	0.364	*0.163*	5.0	*1.0*



Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits, and higher levels also are allowed for exposures to small areas, such that the spatially averaged levels do not exceed the limits. However, neither of these allowances is incorporated in the conservative calculation formulas in the FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels. Hammett & Edison has built those formulas into a proprietary program that calculates, at each location on an arbitrary rectangular grid, the total expected power density from any number of individual radio sources. The program allows for the description of buildings and uneven terrain, if required to obtain more accurate projections.

RFR.CALC™ Calculation Methodology

Assessment by Calculation of Compliance with FCC Exposure Guidelines

The U.S. Congress required (1996 Telecom Act) the Federal Communications Commission ("FCC") to adopt a nationwide human exposure standard to ensure that its licensees do not, cumulatively, have a significant impact on the environment. The maximum permissible exposure limits adopted by the FCC (see Figure 1) apply for continuous exposures from all sources and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health. Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits.

Near Field.

Prediction methods have been developed for the near field zone of panel (directional) and whip (omnidirectional) antennas, typical at wireless telecommunications cell sites. The near field zone is defined by the distance, D, from an antenna beyond which the manufacturer's published, far field antenna patterns will be fully formed; the near field may exist for increasing D until some or all of three conditions have been met:

$$1)\ D > \frac{2h^2}{\lambda} \qquad 2)\ D > 5h \qquad 3)\ D > 1.6\lambda$$

where h = aperture height of the antenna, in meters, and
λ = wavelength of the transmitted signal, in meters.

The FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) gives this formula for calculating power density in the near field zone about an individual RF source:

$$\text{power density}\quad S = \frac{180}{\theta_{BW}} \times \frac{0.1 \times P_{net}}{\pi \times D \times h}, \quad \text{in mW/cm}^2.$$

where θ_{BW} = half-power beamwidth of antenna, in degrees, and
P_{net} = net power input to the antenna, in watts.

The factor of 0.1 in the numerator converts to the desired units of power density. This formula has been built into a proprietary program that calculates distances to FCC public and occupational limits.

Far Field.

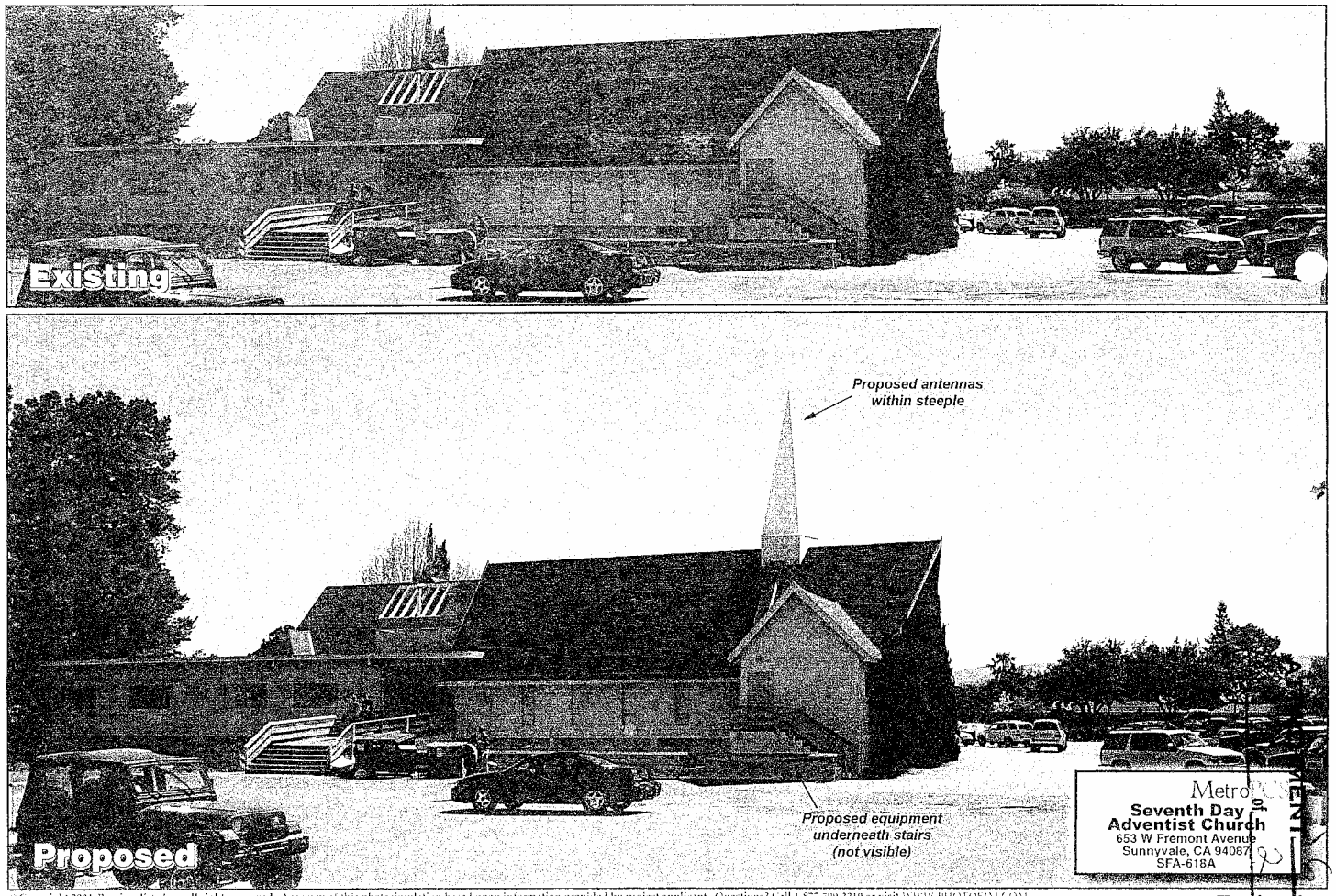
OET-65 gives this formula for calculating power density in the far field of an individual RF source:

$$\text{power density}\quad S = \frac{2.56 \times 1.64 \times 100 \times RFF^2 \times ERP}{4 \times \pi \times D^2}, \quad \text{in mW/cm}^2.$$

where ERP = total ERP (all polarizations), in kilowatts,
RFF = relative field factor at the direction to the actual point of calculation, and
D = distance from the center of radiation to the point of calculation, in meters.

The factor of 2.56 accounts for the increase in power density due to ground reflection, assuming a reflection coefficient of 1.6 (1.6 x 1.6 = 2.56). The factor of 1.64 is the gain of a half-wave dipole relative to an isotropic radiator. The factor of 100 in the numerator converts to the desired units of power density. This formula has been built into a proprietary program that calculates, at each location on an arbitrary rectangular grid, the total expected power density from any number of individual radiation sources. The program also allows for the description of uneven terrain in the vicinity, to obtain more accurate projections.

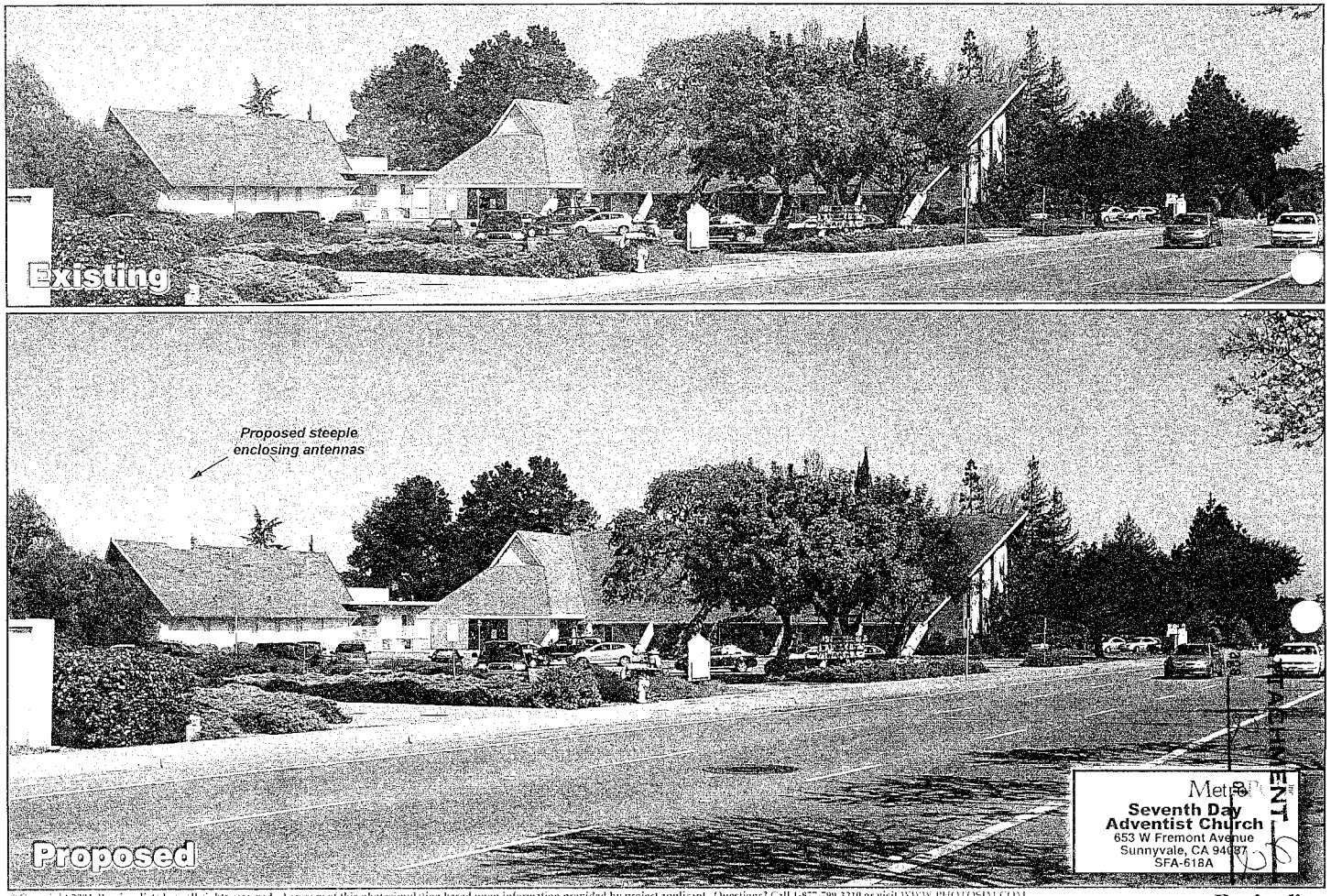
Photosimulation of view looking south from the back corner of the parking lot.



Previsualists

4/21/2004

Photosimulation of view looking northeast from across Fremont Ave.



Previsualists